

WHAT IS CLAIMED IS:

- 1 1. A process for automatically translating a specification defining a computer program
2 to be automatically written by a computer into a computer program that implements the
3 requirements of said specification, said specification defining at least classes of objects
4 having attributes, services and relationships with other classes, said specification written
5 in a formal language, comprising:
 - 6 using a computer, automatically write computer code that will request user name
7 and password, receive any responses and authenticate the user;
 - 8 using a computer, automatically write computer code that will determine this
9 user's privilege level and query said formal language specification and determine all
10 object attributes this user has privilege to see and all services this user can invoke;
 - 11 using a computer, automatically write computer code which queries said
12 specification for all services of all classes that any authorized user may invoke and
13 identifies an object server which will implement said service;
 - 14 using a computer, automatically write code that will retrieve service arguments
15 for all services from a user or from another object server or from another process, as
16 appropriate;
 - 17 using a computer, automatically write code that displays menus options, icons or
18 creates any other means by which a user or another process can invoke a service, and
19 which receives input to invoke a particular service and responds by sending a message
20 to the appropriate object server to invoke the service, said message including the
21 necessary arguments for the service to execute;
 - 22 using a computer, automatically write code that implements an object server for
23 every service, each of which first checks to verify that state transitions are valid and
24 make sense for the current state of objects the object service will be altering the state
25 of;

26 using a computer, automatically write code for every object server that verifies
27 preconditions are satisfied before making state transitions of any objects the states of
28 which are acted upon by the object server;

29 using a computer, automatically write code to make all valuation calculations
30 required by said specification of each object server;

31 using a computer, automatically write code to verify that integrity constraints
32 specified in said specification on the values of attributes of objects have been satisfied
33 after execution of a service and take action if said integrity constraints are not satisfied;
34 and

35 using a computer, automatically write code for every object server to test trigger
36 relationships specified in said specification after execution of a service and carry out
37 appropriate action if a trigger event has occurred.

1 2. An apparatus for automatically translating a specification defining a computer
2 program to be automatically written by a computer into a computer program that
3 implements the requirements of said specification, said specification defining at least
4 classes of objects having attributes, services and relationships with other classes, said
5 specification written in a formal language, comprising:

6 a computer programmed to perform the following functions:

7 automatically write computer code that will request user name and password,
8 receive any responses and authenticate the user;

9 automatically write computer code that will determine this user's privilege
10 level and query said formal language specification and determine all object attributes
11 this user has privilege to see and all services this user can invoke;

12 automatically write computer code which queries said specification for all
13 services of all classes that any authorized user may invoke and identifies an object
14 server which will implement said service;

15 automatically write code that will retrieve service arguments for all services
16 from a user or from another object server or from another process, as appropriate;
17 automatically write code that displays menus options, icons or creates any
18 other means by which a user or another process can invoke a service, and which receives
19 input to invoke a particular service and responds by sending a message to the
20 appropriate object server to invoke the service, said message including the necessary
21 arguments for the service to execute;

22 automatically write code that implements an object server for every service,
23 each of which first checks to verify that state transitions are valid and make sense for
24 the current state of objects the object service will be altering the state of;

25 automatically write code for every object server that verifies preconditions
26 are satisfied before making state transitions of any objects the states of which are
27 acted upon by the object server;

28 automatically write code to make all valuation calculations required by said
29 specification of each object server;

30 automatically write code to verify that integrity constraints specified in said
31 specification on the values of attributes of objects have been satisfied after execution
32 of a service and take action if said integrity constraints are not satisfied; and

33 automatically write code for every object server to test trigger relationships
34 specified in said specification after execution of a service and carry out appropriate
35 action if a trigger event has occurred.

- 1 3. A computer-readable medium containing instructions for controlling a computer to
- 2 automatically translate a specification defining a computer program to be automatically
- 3 written by a computer into a computer program that implements the requirements of
- 4 said specification, said specification defining at least classes of objects having

5 attributes, services and relationships with other classes, said specification written in a
6 formal language, by:

7 automatically writing computer code that will request user name and password,
8 receive any responses and authenticate the user;

9 automatically writing computer code that will determine this user's privilege
10 level and query said formal language specification and determine all object attributes
11 this user has privilege to see and all services this user can invoke;

12 automatically writing computer code which queries said specification for all
13 services of all classes that any authorized user may invoke and identifies an object
14 server which will implement said service;

15 automatically writing computer code that will retrieve service arguments for
16 all services from a user or from another object server or from another process, as
17 appropriate;

18 automatically write code that displays menus options, icons or creates any
19 other means by which a user or another process can invoke a service, and which receives
20 input to invoke a particular service and responds by sending a message to the
21 appropriate object server to invoke the service, said message including the necessary
22 arguments for the service to execute;

23 automatically writing code that implements an object server for every
24 service, each of which first checks to verify that state transitions are valid and make
25 sense for the current state of objects the object service will be altering the state of;

26 automatically write code for every object server that verifies preconditions
27 are satisfied before making state transitions of any objects the states of which are
28 acted upon by the object server;

29 automatically write code to make all valuation calculations required by said
30 specification of each object server;

31 automatically write code to verify that integrity constraints specified in said
32 specification on the values of attributes of objects have been satisfied after execution
33 of a service and take action if said integrity constraints are not satisfied; and
34 automatically write code for every object server to test trigger relationships
35 specified in said specification after execution of a service and carry out appropriate
36 action if a trigger event has occurred.